

the truncate end, arranged in nearly regular longitudinal rows for two-thirds the length, confused into normal reticulations at the depressed third; pits rather deep, well-marked. Length .7, width .5, height about .3 mm.

*Stage I.* Head rounded, erect, pale, yellowish, the sutures faintly and mouth brown, ocelli black. Body normal, short and thick, yellowish with distinct green tint and fine, discreet, purple brown lines, about as wide as the intervening spaces, dorsal (distinct on the cervical shield), subdorsal, lateral, stigmatal and fainter subventral ones. Shields all concolorous; tubercles obscure; setae short, stiff, black, enlarged at tips. Feet normal, pale. Shields faintly lined.

*Stage II.* Head round, erect, free, greenish luteous, mouth brown, eye black; smooth, shining; width .5 mm. Body normal, moderate, smooth, green with dorsal, subdorsal and lateral pulverulent, subgeminat, blackish bands and a single suprastigmatal one; subventral fold pale. Tubercles elevated, concolorous; setae short, dark, capitate. Shields undifferentiated. Thoracic feet faintly reddish, abdominal ones green. Subventral and ventral lines more dotted and broken, geminate, blackish.

*Stage III.* Head round, erect, broad, flat before, vertex slightly under joint 2; pale green, faintly brown shaded on the sides above the black ocelli; width .9 mm. Body robust, moderate, uniform, incisures not depressed, segments not elongate. Whitish

green, opaque; addorsal, subdorsal, lateral geminate crinkly blackish lines, darker green filled, uniform over the cervical shield but replaced by yellowish green on the anal plate; a single suprastigmatal line; subventer and venter yellowish green with two subventral and a single ventral greenish black lines. Tubercles black, minute; setae short. Feet pale, the abdominal ones very faintly lined.

*Stage IV.* Head rounded, erect, free; all leaf green; clypeus rather high, ocelli black; width 1.3 mm. Body rather short, as before. Green with the narrow blackish, double, pale-filled lines as before but both dorsally and ventrally practically alike. Subventral fold whitish. Feet green, the anal ones with triangular shields like the anal plate. No cervical shield. Tubercles small, concolorous, with short, pointed black setae. The lines are addorsal, subdorsal and lateral (substigmatal-subventral fold, not dark edged), subventral and adventral, all geminate, pale, almost whitish filled. Later the color pales and the lines look whitish with dark green edges. Subventral fold white; dorsal incisures folded, yellowish white. A short, robust larva, uniform, the segments not elongate.

*Food plant,* bearberry (*Arctostaphylos uva ursi*).

Eggs from a female taken on the summit of the foothills back of Golden, Colorado (Chimney Gulch).

## THE HATCHING OF EACLES IMPERIALIS.

BY CAROLINE G. SOULE, BROOKLINE, MASS.

Eggs of *Eacles imperialis* had a red line part of the way around the edge of each. As the larva developed this line became broken, and, on the day before hatching, showed the red dashes to be the dorsal tubercles of the

larva. This could be seen without a lens, but a fifteen-diameters glass showed also the setae at the top of each tubercle, those on the four tubercles over the head being black, the others white. When the larva hatched the red

raised dots—for they were not more than that—began to grow at once, the red color remaining in the tip of each, and the lower part having almost no color at first. The growth was so rapid that in five minutes after leaving the shells the long thoracic tubercles or “horns” had their normal size and shape, and the lateral spines had appeared. The setae grew dark first, then the spines, then a pale red color suffused the “horn” as if it ran down from the tip, which grew paler.

The abdominal tubercles gained the normal color first, in about fifteen minutes, and in an hour all the tubercles, spines, feet, tips of props, and mouthparts had become black.

The development of the long tubercles was very rapid and very interesting, and was watched in many instances, each one giving exactly the same details in the same order, though the caterpillars differed much in the time they took to eat their way out of the shell. Some needing an hour, others over two hours.

Observation of another set of eggs showed that the color of the thoracic setae varied, some larvae having the setae all black before hatching, others having only those of the first segment black, the others being white.

LITERATURE.—Comstock and Kellogg's Elements of Insect Anatomy, advertised on another page, is an admirable guide to the practical study of the anatomy of insects. The subjects treated in detail are the external anatomy of *Melanoplus* and *Pterostichus*, the internal anatomy of *Corydalis* and the general anatomy of the larva of *Holorusia*. Chapters explanatory of technical terms, of the mouthparts and venation and of methods of insect histology add everything that is requisite for the beginner. We cordially commend the work.

CORRECTION:—Page 273, col. 2, line 1, for *Odynerus* read *Eumenes*.

R. FRIEDLÄNDER & SON, Publishers, Berlin, N. W., Carlstrasse, 11.

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